

R E M A R K S

Careful review and examination of the subject application are noted and appreciated.

The present invention concerns an integrated circuit comprising a test circuit that may be configured to generate a test signal having a predetermined pulse width in response to a control input. The test signal generally tracks process corners of the integrated circuit and may be used to predict a failure of the integrated circuit.

SUPPORT FOR THE CLAIM AMENDMENTS

Support for the amendments to the claims can be found in the specification as originally filed, for example, on page 1, lines 15-19 and in the claims as originally filed, for example, claim 12. As such, no new matter has been added.

IN THE DRAWINGS

The objection to the drawings is respectfully traversed and should be withdrawn. No admission has been made that the correlation between Tsd and probability of failure as illustrated in FIG. 1 is prior art.

Applicants' representative respectfully disagrees with the Examiner's apparent position that solely because FIG. 1 is discussed in the background section of the specification, FIG. 1 is

admitted as known in prior art (see page 2, paragraph no. 2 of the Office Action). MPEP §608.01(c) provides

A paragraph(s) describing to the extent practical the state of the prior art **or other information disclosed known to the applicant**, including references to specific prior art **or other information where appropriate**. Where applicable, the problems involved in the prior art **or other information** disclosed which are solved by the applicant's invention should be indicated. (MPEP 608.01(c) (2), emphasis added)

Thus, the background of the specification does not necessarily contain only prior art, but may also contain **other information known to the Applicants** about the problem solved by the Applicants' invention. The Office Action fails to present any objective evidence that the information illustrated in FIG. 1 is disclosed or taught in any prior art references. Simply because information is known to the Applicants, it does not necessarily follow that the information is prior art. The Office Action does not present any objective evidence that the correlation between Tsd and probability of failure illustrated in FIG. 1 of the specification was known by anyone other than the Applicants at the time of the invention. Therefore, the characterization of Background as admitted prior art (based exclusively on the presentation of FIG. 1 in the background section) does not appear to be proper.

Specifically, the use of information in the Background where (i) the information is provided by the Applicants to facilitate understanding of the problem addressed and the solution

provided by the present invention and (ii) the Office has failed to factually establish that such information would have been known by one of ordinary skill in the art at the time of the invention does not appear to be proper. In particular, "It is improper, in determining whether a person of ordinary skill would have been led to [a] combination of references, simply to '[use] that which the inventor taught against its teacher'" (In re Lee, 61 USPQ 2d 1430, 1434 (Fed. Cir. 2002) citing W.L. Gore v. Oarlock, Inc.). Since the Background is part of the specification, use of the information in the Background as prior art without a showing that the information was available in the prior art clearly would result in using that which only the inventor taught against its teacher and, therefore, does not appear to be proper. Therefore, the requirement to label FIG. 1 as prior art (based exclusively on the presentation of FIG. 1 in the background section of the specification) does not appear to be proper and should be withdrawn. However, a replacement FIG. 1 is submitted herewith which includes the amendment approved by the Examiner on page 2, paragraph no. 1 of the Office Action.

CLAIM REJECTIONS UNDER 35 U.S.C. §102

The rejection of claim 11 under 35 U.S.C. §102 as being anticipated by Malek-Khosravi et al. '161 (hereinafter Malek-Khosravi) is respectfully traversed and should be withdrawn.

Malek-Khosravi is directed to a minimum pulse width test module on a clocked logic integrated circuit (Title).

In contrast, the presently claimed invention (claim 11) provides an integrated circuit comprising (i) means for generating a test signal having a predetermined pulse width in response to a control input and (ii) means for predicting failure of part or all of the integrated circuit in response to the test signal. Malek-Khosravi does not disclose or suggest each and every element of the presently claimed invention, arranged as in the present claims. As such, the presently claimed invention is fully patentable over Malek-Khosravi and the rejection should be withdrawn.

The application of a prior art reference to a means or step plus function limitation requires that the prior art element perform the identical function specified in the claim (MPEP §2182). Malek-Khosravi does not perform an identical function to the presently claimed invention. Specifically, the presently claimed invention provides a means for generating a test signal having a predetermined pulse width in response to a control input. In contrast, Malek-Khosravi generates sequences of variable width clock pulses in which each successive pulse is automatically increased or decreased in width (see column 2, lines 18-20 of Malek-Khosravi). Furthermore, Malek-Khosravi states that merely generating pulses of a simple width would not solve the problem which is solved by the invention of Malek-Khosravi (see column 1,

lines 36-40 of Malek-Khosravi). Since Malek-Khosravi teaches that generating simple pulses of a single width is a problem and generating a sequence of pulses of variable width pulses is the solution, it follows that Malek-Khosravi does not teach the identical function of generating a test signal having a predetermined pulse width in response to a control input, as presently claimed. Therefore, since Malek-Khosravi does not perform the identical function specified in the presently pending claim 11, the presently pending claim 11 is fully patentable over Malek-Khosravi and the rejection should be withdrawn.

Furthermore, Malek-Khosravi also fails to perform the identical function of **predicting** failure of part or all of the integrated circuit in response to a test signal, as presently claimed.

Specifically, the Office Action points to column 3, lines 17-28 of Malek-Khosravi as disclosing a means for predicting failure of part or all of the integrated circuit in response to a test signal. However, the section cited by the Office describes a process of determining a minimum pulse width to be used with the integrated circuit of Malek-Khosravi which involves the use of an external scope. Specifically, Malek-Khosravi discloses that the external scope is used to see when a pulse width has been set to too short of a time for a correct response (see column 3, lines 26-28 of Malek-Khosravi). Since the particular pulse width which may

be considered as producing an error is only detectable through the use of an external scope **when the error has already occurred**, Malek-Khosravi clearly does not disclose or suggest the function of **predicting** failure of part or all of the integrated circuit in response to the test signal, as presently claimed. Therefore, Malek-Khosravi does not disclose or suggest each and every element of the presently claimed invention, arranged as in the present claim 11. As such, the presently claimed invention is fully patentable over the cited reference and the rejection should be withdrawn.

However, even if Malek-Khosravi could be construed as performing the identical function as specified in the presently pending claim 11, the Examiner carries the initial burden of proof for showing that the prior art structure or step is the same as or equivalent to the structure material or acts described in the specification which has been identified as corresponding to the claimed means or step plus function (MPEP §2182). The Office Action fails to provide the required explanation and rationale as to why the prior art element is an equivalent (see page 3, paragraph no. 6 of the Office Action and MPEP §2183). The burden to show that the element shown in the prior art is not an equivalent of the structure material or acts shown **does not** shift to the Applicant until a proper showing has been made by the Office

Action (MPEP §2183 citing *In Re Muldar*, 219 USPQ 189 (Fed.Cir. 1983)).

Since the Office Action has failed to provide any explanation or rationale, the Office Action fails to make a *prima facie* case of equivalence and has not met the Office's burden proof for showing that the prior art structure or step is the same as or equivalent to the structure material or acts described in the specification which has been identified as corresponding to the claimed means or step plus function (MPEP §2182). As such, the presently claimed invention is fully patentable over Malek-Khosravi and the rejection should be withdrawn.

CLAIM REJECTIONS UNDER 35 U.S.C. §103

The rejection of claims 1-10 and 12-20 under 35 U.S.C. §103 as being unpatentable over Ahmad et al. (hereinafter Ahmad) in view of Malek-Khosravi and the background section of the specification (hereinafter Background) is respectfully traversed and should be withdrawn.

Ahmad is directed to a semiconductor array having a built-in test circuit for wafer level testing (Title). Malek-Khosravi is directed to a minimum pulse width test module on a clocked logic integrated circuit (Title).

In contrast to the cited references, the present invention (claim 1) provides an integrated circuit comprising a

test circuit that may be configured to generate a test signal having a predetermined pulse width in response to a control input. The test signal generally tracks process corners of the integrated circuit and predicts a failure of the integrated circuit. Claims 11 and 12 include similar recitations. Ahmad and Malek-Khosravi do not teach or suggest each and every element of the presently claimed invention. Furthermore, as stated above in connection with the objections to the drawings, no admission has been made that the information disclosed in Background is prior art. The Office Action does not present any objective evidence that the correlation between Tsd and probability of failure illustrated in FIG. 1 of the specification was known by anyone other than the Applicants at the time of the invention. Therefore, the characterization of Background as admitted prior art (based exclusively on the presentation of FIG. 1 in the background section of the specification) does not appear to be proper (see, for example, page 5, lines 3-5 and lines 7-8 of the Office Action).

Specifically, the use of information in the Background where (i) the information is provided by the Applicants to facilitate understanding of the problem addressed and the solution provided by the present invention and (ii) the Office has failed to factually establish that such information would have been known by one of ordinary skill in the art at the time of the invention does not appear to be proper. In particular, "It is improper, in

determining whether a person of ordinary skill would have been led to [a] combination of references, simply to '[use] that which the inventor taught against its teacher'" (In re Lee, 61 USPQ 2d 1430, 1434 (Fed. Cir. 2002) citing W.L. Gore v. Oarlock, Inc.). Since the Background is part of the specification, use of the information in the Background without a showing that the information was available in the prior art clearly would result in using that which only the inventor taught against its teacher and, therefore, does not appear to be proper. As such, the presently claimed invention is fully patentable over the Ahmad and Malek-Khosravi, alone or in combination, and the rejection should be withdrawn.

The Office Action admits that Ahmad does not expressly disclose a test signal having a predetermined pulse width in response to a control input, where the test signal tracks process corners and predicts failure of the integrated circuit, as presently claimed (see page 4, lines 4-7 from the bottom, of the Office Action). Furthermore, despite the position taken in the Office Action on page 4, last three lines through page 5, line 2, Malek-Khosravi does not teach or suggest a circuit configured to generate a test signal with a predetermined pulse width in response to a control input where the test signal tracks process corners and predicts a failure of the integrated circuit, as presently claimed.

In particular, Malek-Khosravi teaches generation of a sequence of pulses having variable pulse width where each

successive pulse is automatically increased or decreased (see fig. 2 and column 2, lines 18-20 and lines 35-36 of Malek-Khosravi). The reference in the Office Action to FIG. 2 of Malek-Khosravi as supporting the position that the signal tracks process corners is not technically correct. FIG. 2 of Malek-Khosravi illustrates various pulse sequences that are generated by the test module of Malek-Khosravi (see column 2, lines 35-36 of Malek-Khosravi). Therefore, the combination of Ahmad and Malek-Khosravi does not teach or suggest each and every element of the presently claimed invention. As such, the presently claimed invention is fully patentable over the cited references and the rejection should be withdrawn.

Furthermore, Malek-Khosravi appears to teach away from generating a test signal having a predetermined pulse width in response to a control signal as presently claimed. Specifically, Malek-Khosravi states that one of the problems with using available instruments called pulse generators to generate narrow width clock pulses as test signals for the clocked logic chips is that at any one time they merely generate pulses of a simple width. Therefore, since Malek-Khosravi teaches that merely generating pulses of a simple width provides a problem as far as test signals for clocked logic chips, it follows that modification of Malek-Khosravi to provide a single pulse of predetermined width would render the invention of Malek-Khosravi unsatisfactory for its intended

purpose. As such, there is no suggestion or motivation to make the proposed modification (see MPEP §2143.01) and *In re Gordon*, 221 USPQ 1125 (Fed.Cir. 1984). Therefore, the Office Action fails to meet the Office's burden of factually establishing a *prima facie* case of obviousness (MPEP §2142). As such, the presently claimed invention is fully patentable over the combination of Ahmad and Malek-Khosravi and the rejection should be withdrawn.

Furthermore, the position taken in the Office Action that "at the time of the invention, it would have been obvious for a person of ordinary skill in the art to have combined into Ahmad et al. the teachings of Malek-Khosravi et al., **in light of the Applicant's own admitted prior art**" to arrive at the presently claimed invention clearly evidences the use of hindsight in the assembly of the cited references to support the obviousness rejection. The Federal Circuit has stated that it "is improper, in determining whether a person of ordinary skill would have been led to [a] combination of references, simply to '[use] that which the inventor taught against its teacher'" (*In re Lee*, 61 USPQ 2d 1430, 1434 (Fed. Cir. 2002) citing *W.L. Gore v. Oarlock, Inc.*). Since the Background is part of the specification, use of the information in the Background without a showing that the information was available in the prior art clearly would result in using that which only the inventor taught against its teacher and, therefore, does not appear to be proper. Therefore, the Office Action fails to

meet the Office's burden of establishing a *prima facie* case of obviousness. As such, the presently claimed invention is fully patentable over the cited references and the rejection should be withdrawn.

Claims 2-10 and 13-23 depend either directly or indirectly from claims 1 and 12 which are believed to be fully patentable over the cited references. New claim 24 depends from claim 1 and is believed to be fully patentable over the cited references. As such, the presently claimed invention is fully patentable over the cited references and the rejection should be withdrawn.

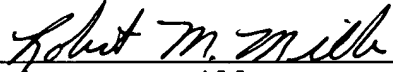
Accordingly, the present application is in condition for allowance. Early and favorable action by the Examiner is respectfully solicited.

The Examiner is respectfully invited to call the Applicants' representative should it be deemed beneficial to further advance prosecution of the application.

If any additional fees are due, please charge our office
Account No. 50-0541.

Respectfully submitted,

CHRISTOPHER P. MAJORANA, P.C.


Robert M. Miller
Registration No. 42,892
24025 Greater Mack, Suite 200
St. Clair Shores, MI 48080
(586) 498-0670

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

1. (AMENDED) An integrated circuit comprising:

a test circuit configured to generate a test signal having a predetermined pulse width in response to a control input, wherein said test signal (i) tracks process corners and [can be
5 used to predict] (ii) predicts a failure of said integrated circuit.

12. (TWICE AMENDED) A method for predicting failure of an integrated circuit prior to life testing comprising the steps of:

(A) entering a test mode;

5 (B) measuring an operation of said integrated circuit in response to a test signal having a predetermined pulse width and generated on said integrated circuit in response to a control input; and

(C) [detecting] predicting said failure of said
10 integrated circuit in response to failure of said operation.

19. (AMENDED) The method according to claim 12, wherein said failure [comprises] of said integrated circuit is related to a poor contact in cross-coupled latch transistors of a memory cell.

24. (NEW) The apparatus according to claim 1, wherein said failure is independent of said test signal.